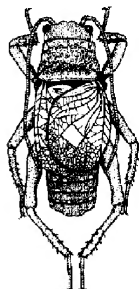


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NOTES ON PALEARCTIC HEMEROBIIDAE (NEUROPTERA). I. INTRODUCTION AND GENUS *WESMAELIUS* KRUGER, 1922. PART 1. SUBGENUS *WESMAELIUS*

V.N.Makarkin

Institute of Biology and Pedology, Vladivostok-22, 690022, Russia

A review of three species of the subgenus *Wesmaelius* Kruger, 1922 with special attention to wing venation and detailed distribution is given. Male genitalia of *W. asiaticus* Yang is described.

KEY WORDS: Hemerobiidae, *Wesmaelius*, taxonomy, wing venation.

В.Н. Макаркин. Заметки по палеарктическим гемеробидам (Neuroptera, Hemerobiidae). I. Введение и род *Wesmaelius* Kruger, 1922. Часть 1. Подрод *Wesmaelius* // Дальневосточный энтомолог. 1995. № 24. С. 1-13.

Дается обзор 3 видов подрода *Wesmaelius* Kruger, 1922 с подробным обсуждением жилкования крыльев и распространения видов. Описаны гениталии самца *W. asiaticus* Yang.

Биолого-почвенный институт, Дальневосточное отделение Российской Академии Наук, Владивосток-22, 690022, Россия.

INTRODUCTION

This paper is the first one from a series in which the Palearctic species of Hemerobiidae will be observed. The family includes approximately 550 species in 26 genera. The most important monographs on the world Hemerobiidae are a check-list of the species of the world (Monserrat, 1990) and a comprehensive generic revision (Oswald, 1993).

There are about 170 Palearctic species of Hemerobiidae, whereas Europe well studied (Kilington, 1936-1937; Kis et al., 1970; Aspöck et al., 1980), the Asian fauna (especially Chinese one) remains little-known. The most important papers on the Asian fauna are Tjeder (1936), Kimmins (1943), Nakahara (1960), Kuwayama (1962), Yang (1964; 1980; 1981) and Makarkin (1985; 1986).

The main purpose of my papers is to describe the wing venation, with special reference to its variability. The general hemerobiid wing venation have been described by Tillyard (1916), Comstock (1918), Kruger (1922), Killington (1936), Tjeder (1961) etc. I would like to pay attention to certain features of the venation and provide my interpretation of the vein designations (Figs 1-2).

Variability of the venation within the family practically not studied yet. Killington (1932), Fraser (1946) and Oswald (1988) reported the variability of several species. Descriptions contain both variation of the quantitative features (number of *Rs*-branches, *CuA*-branches, crossveins in gradate series etc.) and unusual (abnormal) conditions of the features; the former represents the normal venation.

Male and/or female genitalia are described or referred to respective literature. The terminology of genitalia proposed by Oswald (1993) here is accepted.

Distribution data for most species are given. New records are asterisked (*).

ABBREVIATIONS. *A1-A3* - first to third anal veins; A.R. - autonomous region (administrative division); *b* - basal crossvein between *Rs* and *M* in hind wing; *CuA* - anterior branch of cubital vein; *CuA1* - most proximal branch of *CuA*; *CuP* - posterior branch of cubital vein; ex. - specimen; f - female; *Gr1* - inner gradate series of crossveins; *Gr2* - intermediate gradate series of crossveins; *Gr3* - outer gradate series of crossveins; m - male; *M* - medial vein; N - number of studied wings; obl. - oblast' (administrative division); *R* - radial vein; *Rs1* - first, most proximal, branch of *R*; *r* - basal intraradial crossvein in hind wing; *rv* - humeral recurrent vein in fore wing; *Sc* - subcostal vein; vic. - vicinities.

Genus *Wesmaelius* Kruger, 1922

Wesmaelius Kruger, 1922: 170. Type species: *Hemerobius concinnus* Stephens, 1836, by original designation.

DESCRIPTION. Fore wings. Rather broad with rounded or slightly pointed apex. Costal area moderately expanded. Branches of *Sc* with 1-2 forkings. *rv* long with several short simple branches, one of which rarely forked. Subcostal

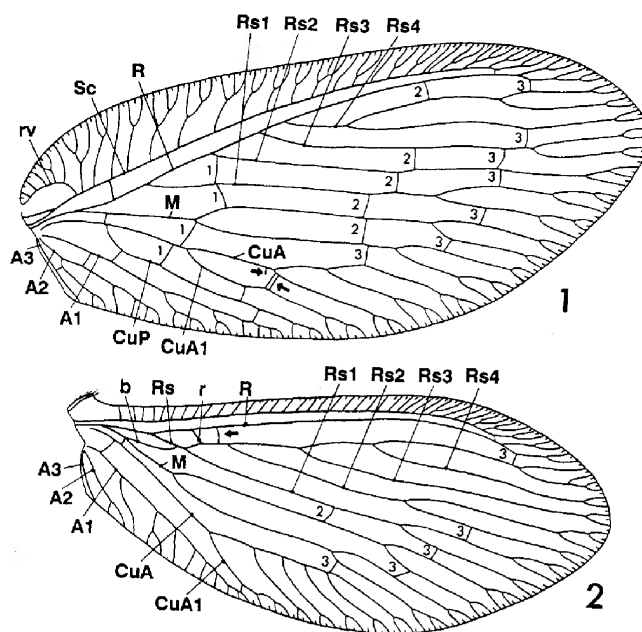
area narrow. Between *Sc* and *R* normally 1 basal and 1 apical crossveins. *Rs* normally with 3 (subgenus *Kimminsia*) or 4 (subgenus *Wesmaelius*) branches. Distal branch of *Rs* with mostly 2-3 secondary branches running parallel to the proximal branches. Basal forking of *M* situated almost always distally to the arising of *Rs1*. *CuA* pectinately branched. *CuP* with only marginal forkings. *A1* long with several branches. *A2* bifurcated nearly its beginning, both branches with marginal forkings. *A3* simple. Inner gradate series of crossveins (*Gr1*) short, with 3 (subgenus *Kimminsia*, *rs1-m*, *m-cua* and *cua-cup*) or 4 (subgenus *Wesmaelius*) crossveins, the latter has an additional crossvein (*rs1-rs2*). Intermediate series (*Gr2*) interrupted, usually with 4-5 crossveins between *R* and its distal branch and between *CuA* and the proximal secondary branch of distal *Rs*-branch. Outer series (*Gr3*) complete, usually consisting of 7-8 crossveins. Posterior crossvein of this series (*m-cua*) shifted basally so that it is situated often proximally to the ending crossvein of *Gr2* (e.g. between branches of *M*). Between branches of *Cu* and *A1* at least 1 crossvein (usually 3), very rarely crossveins absent. Basal crossveins: *m-cua*, *cup a1*, *a1-a2* and *a2-a3*.

Hind wings. *Rs* mostly 4-branched. Intraradial cell small, triangular. *r* long. *b* ending proximally to *r*. *CuA* abruptly curved forwards at the beginning of *CuA1*, pectinately branched. *CuP* reduced entirely. *A1* with a long basal branch and a number of short marginal branches. *A2* simple or bifurcated. *A3* simple. *Gr2* normally with 2 crossveins between *M* and *Rs2*. *Gr3* mostly with 7 crossveins between *R* and *CuA*. Marginal crossvein between *CuA* and *A1* always present. Basal crossveins: *m-cua* (just beyond of the beginning of *b*) and *cua a1*.

Male genitalia. Tergite 9 usually expanded ventrally. Ectoproct with ventral or lateroventral process usually pointed and armed apically, with a row of short heavy pigmented pegs. The shape and length of the process are very diverse and varying from very long and curved (e.g. *W. altissimus*) to very short and thorn-like (subgenus *Wesmaelius*). Callus cerci with relatively large and numerous trichobothria. Sternite 9 rather narrow with 2 posterior lobes embraced the andomen from behind. Gonarcus arch-like with broad wing-like hemigonarcus and rather broad gonopods. Hemigonarcus usually with paired paramediuncus and rarely with additional paired internal processus (i.e. *W. sinicus*, *W. punctatus*). Mediuncus unpaired, with pointed apex. Parabuculum fused basally, with pointed posterior apices and with two dorsal broad lobes. Hypandrium internum usual.

Female genitalia. Tergite 8 narrow band-like rounded ventrally. Tergite 9 expanded ventrally. Ectoproct more or less rounded, oval or triangular, with rounded angles. Gonocoxites 9 semi-oval or semi-rounded. Subgenitalia well-developed, of various sizes and shape, with mostly separated lateral lobes. Insemination-fertilization canal bag-like.

CLASSIFICATION. Subdivision of the genus in 2 subgenera (*Wesmaelius* and *Kimminsia*) has been widely accepted.

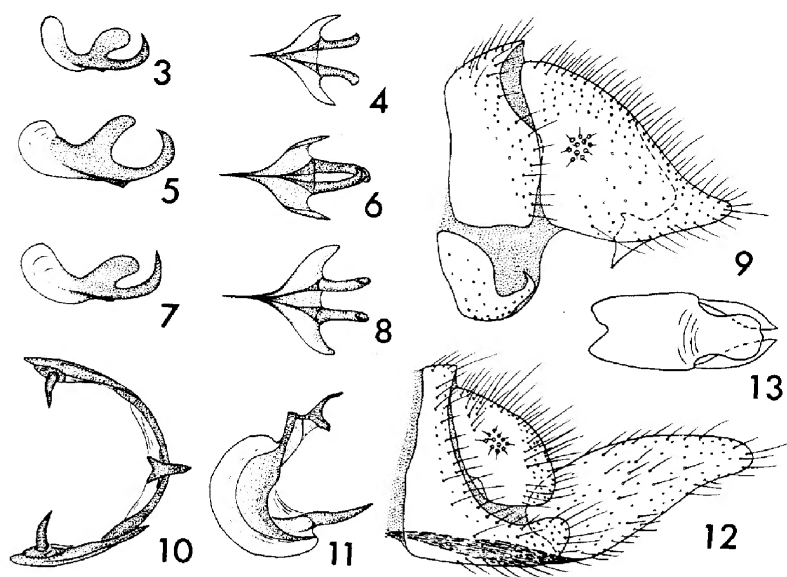


Figs. 1-2. Wing venation of *Wesmaelius concinnus*: 1) fore wing; 2) hind wing. Additional veins and anomalies are indicated by arrows (see Abbreviations for vein designations).

Subgenus *Wesmaelius* Kruger, 1922

DIAGNOSIS. The subgenus is very homogenous. It is characterized by the following characters: fore wing with *Rs* mostly 4-branched, *Gr1* with additional crossvein *rs1-rs2*; hind wing with *Gr2* having only one crossvein; male with very narrow hemigonarcus and long paramediuncus; female with very big and long gonocoxites 9. Only small differences exist in genitalia both male and female.

SPECIES COMPOSITION. This subgenus includes 5 very closely related species: *W. concinnus* (Steph.), *W. quadrifasciatus* (Reuter), *W. asiaticus* Yang, *W. martinae* Leraut (France) and *W. longifrons* Walk. (North America). Of these, *W. martinae* is only known for female, hence its species rank needs to be confirmed. *W. longifrons* is very closely related to *W. quadrifasciatus*.



Figs. 3-13. Genitalia of *Wesmaelius* s.str. 3, 4) *Wesmaelius concinnus*, parabuculum; 5, 6) *W. quadrifasciatus*, parabuculum; 7-13) *W. asiaticus*: 7, 8) parabuculum, 9) apex of abdomen of male, 10, 11) gonarcus, 12) apex of female abdomen, 13) subgenital plate. 3, 5, 7, 9, 11, 12, lateral view; 4, 6, 8, 10, 13, dorsal view.

***Wesmaelius (Wesmaelius) concinnus* (Stephens, 1836)**

Figs. 1-4

Hemerobius concinnus Stephens, 1836: 106, tab. 30, fig. 3. Great Britain: "in July at Riply; at South Lambeth; near Edinburgh". Depository unknown, probably in British Museum of Natural History.

Hemerobius cylindripes Wesmael, 1841: 219. Belgium: "Hab. prope Bruxellas". Depository unknown. Synonymized by MacLachlan, 1868: 188.

Hemerobius atomarius Goszy, 1852: 346, pl. 5, fig. 2. No any data, apparently lost. Synonymized by MacLachlan, 1868: 188.

COLORATION. Head pale, yellowish brown (dark brown in the specimen from Transbalkalia). Palpi and antennae pale, brownish. Thorax brownish to brownish yellow. Notum with inconspicuous brown markings. Legs pale, yellowish to brownish, apical tarsal joints darker. The fore and middle tibiae with indistinct spots. Fore wing membrane pale, slightly yellowish. Sagittate spots very pale, poorly visible. Crossveins of the series *Gr2* and *Gr3* and of cubital

area margined with brownish. Crossvein *m-cu*a in *Gr*3 broadly margined with brown. Longitudinal veins pale with very short dark brown interruptions. Crossveins mostly fuscous. Hindwing membrane pale. Veins mostly pale.

VENATION. Fore wing (N = 47) (Fig. 1). *Rs* with 3 (N=6), 4 (N=39) or 5 (N=2) branches, the distal one with 1 (N=1), 2 (N=17), 3 (N=32) or 4 (N=1) secondary branches. *Gr*1: *rs*1-*rs*2 present (N=40) or absent (N=7), of these 1 double; *rs*1-*m* and *m-cu*a always present, the latter furcate (N=1); *cu*a-*cu*p furcate (N=1); additional intra-*M* crossvein present (2 wings of 1 specimen). *Gr*2 with 6 (N=1), 7 (N=34) or 8 (N=12) crossveins, of these 5 double. *Gr*3 with 8 (N=3), 9 (N=23), 10 (N=19) or 11 (N=2) crossveins, of these 3 double, and 1 triple. Between branches of *Cu* and *A*1 2 (N=3), 3 (N=26), 4 (N=16) or 5 (N=2) crossveins, of these 17 double or triple.

Additional crossveins. One crossvein between *Rs*-branches (N=3) and *Sc*-branches (N=7); basal crossvein *sc-r* double (N=1); basal crossvein *cu*p-*a*1 double (N=1).

Anomalies. *cu*p fused apically with *Cu*A (N=1).

Hind wing (Fig. 2): Variability not examined.

MALE. Parabaculum as in Figs. 3-4, other details see: Killington, 1937: 100, fig. 89; Kis et al., 1970: 191, fig. 88; Aspöck et al., 1980: 198, figs. 499-501.

FEMALE. Description of genitalia see: Kis et al., 1970: Fig. 88; Aspöck et al., 1980: Fig. 548.

FORE WING LENGTH. Male: 9.5-10.7 mm (10.0 mm), N = 5; female: 8.1-12.3 mm (10.4 mm), N = 19.

DISTRIBUTION. EUROPE: Austria, Belgium, Bulgaria, Czechia, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Latvia, Lithuania, Netherlands, Norway, Poland, Romania, Russia (Karelia, Komi, Leningradskaya obl., Novgorodskaya obl., Murmanskaya obl., Moskovskaya obl., Tverskaya obl., Nizhegorodskaya obl.), Slovakia, Slovenia, Switzerland, Ukraine (Kievskaya obl., Lvovskaya obl.), Yugoslavia.- ASIA: Turkey (Anatolia), Siberia ("the Irtysh River" [Hagen, 1858], Tyumenskaya obl., Irkutskaya obl., Buryatia, Chitinskaya obl.).

MATERIAL EXAMINED. About 30 specimens from Estonia, the north of European part of Russia and Siberia (see: Makarkin, 1986; 1987).

Wesmaelius (Wesmaelius) quadrifasciatus (Reuter, 1894)

Figs. 5-6, 14-23

Hemerobius concinnus var. *quadrifasciatus* Reuter, 1894: 12. Finland: Kangasniemi. Depository unknown.

COLORATION. Head almost entirely black; vertex mostly brown; anteclypeus pale. Antennae brownish; scapus darker, dark brown partly or entirely. Palpi brown with dark brown apical segments. Thorax dark brown to

black. The middle part and lateral lobes of pronotum, mesoscutellum and adjacent parts of mesoscutum as well as the middle part of metanotum pale brown to yellowish. Legs brownish. Dark spots on the fore and middle tibiae inconspicuous. Fore wing membrane pale with numerous dark brown and blackish contrastive spots throughout the wing. Largest spots are located near outer margin of the wing. Blackish transverse stripes run through all the gradate series of crossveins. Hindwing membrane unicolorous brownish. Veins mostly dark brown to brown.

VENATION. Fore wing ($N = 156$). *Rs* with 3 ($N=70$), 4 ($N=85$) or 5 ($N=1$) branches; distal one with 1 ($N=3$), 2 ($N=57$), 3 ($N=84$) or 4 ($N=12$) secondary branches. *Gr1*: *rs1-rs2* present ($N=152$) or absent ($N=4$), of these 3 double and 2 furcate; *rs1-m* present ($N=154$) or absent ($N=2$); *m-cua* and *cua-cup* always present, *cua-cup* double ($N=1$) or furcate ($N=1$). *Gr2* with 3 ($N=3$), 4 ($N=22$), 5 ($N=109$), 6 ($N=20$) or 7 ($N=2$) crossveins, of these 14 double, 1 furcate; three wings with very complicated arrangement of *Gr2* (Figs 17-19). *Gr3* with 6 ($N=13$), 7 ($N=62$), 8 ($N=62$) or 9 ($N=19$) crossveins, of these 19 double and 2 furcate (Fig. 17-18). Between *Cu*-branches 0 ($N=4$), 1 ($N=40$), 2 ($N=91$), 3 ($N=14$) or 4 ($N=1$) crossveins, of these 11 double (Fig. 16), 1 triple and 1 furcate.

Additional crossveins. One crossvein between *Sc*-branches ($N=3$), between *R* and *Rs1* ($N=2$), between *R* and *Rs2* ($N=4$, Fig. 15), between *R* and *Rs3* ($N=1$), between branches of *Rs3* ($N=2$), between branches of *M* ($N=3$, Fig. 15).

Anomalies. *Rs1* fused with *Rs2* ($N=1$, Fig. 19); only the base of *Rs2* present ($N=2$); *Rs2* apically fused with *Rs3* ($N=1$); apex of *CuA*-branch reduced ($N=2$, Fig. 15); *CuP* fused with *CuA* ($N=4$, Fig. 16) or with reduced apex ($N=1$).

Hind wing ($N = 71$) (Fig. 21). *Rs* with 4 ($N=34$), 5 ($N=34$) or 6 ($N=3$) branches. *Rs1* arising proximally to *r*, except 1 wing. *CuA1* without apex ($N=1$). *r* very long, double ($N=9$), triple ($N=2$, Fig. 23), furcate ($N=3$) or incomplete ($N=1$, Fig. 22). *b* ending proximally to the beginning of *Rs1* ($N=61$), interstitially ($N=7$) or distally ($N=2$). *Gr2* with 0 ($N=6$), 1 ($N=58$), 2 ($N=6$) or 3 ($N=1$) crossveins. *Gr3* with 5 ($N=37$), 6 ($N=21$), 7 ($N=11$), 8 ($N=2$), of these 1 double, 3 furcate; one *m-cua* absent. Between branches of *Cu* crossveins absent, except 1 wing.

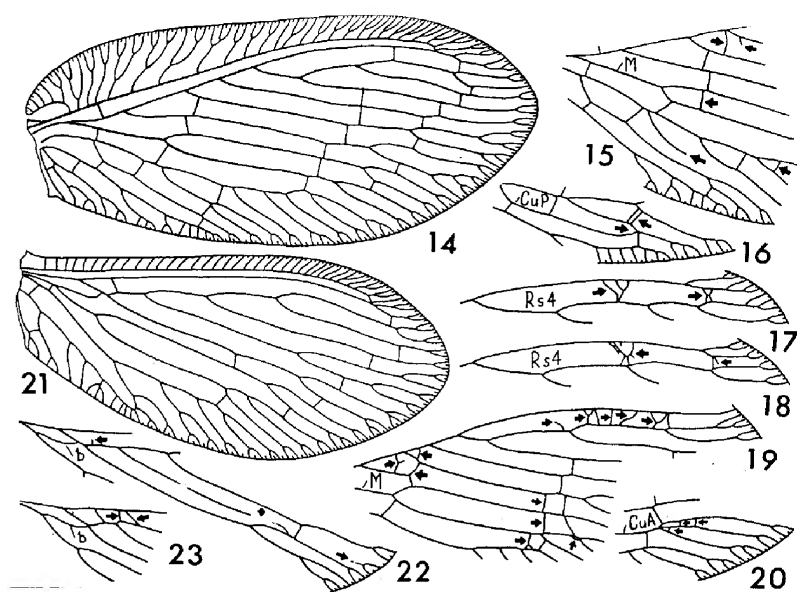
Additional crossvein. *rs1-m* proximal to *Gr2*.

Anomalies. *Rs2* apically incomplete ($N=1$, Fig. 22); *b* incomplete ($N=1$).

MALE. Parabaculum as in Figs. 5-6, other details see: Killington, 1937: 106, fig. 89G; Kis et al., 1970: Fig. 87, Aspöck et al., 1980: Figs. 502-504.

FEMALE. Description of genitalia see: Killington, 1937: Fig. 90; Kis et al., 1970: Fig. 87; Aspöck et al., 1980: Fig. 549.

FORE WING LENGTH. Male: 7.0-9.6 mm (8.6 mm), $N = 15$; female: 7.4-10.7 mm (9.3 mm), $N = 15$.



Figs. 14-23. Wing venation of *Wesmaelius quadrifasciatus*.

DISTRIBUTION. EUROPE: Austria, Belarus, Czechia, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Italy, Latvia, Netherlands, Norway, Romania, Russia (Leningradskaya obl., *Moskovskaya obl., Komi, Tverskaya obl., Permskaya obl.), Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine (Lvovskaya obl., Ivano-Frankovskaya obl., Zakarpatskaya obl.), Yugoslavia.- ASIA: Turkey, Siberia (*Nenetskiy A.R., *Yamalo-Nenetskiy A.R., Taimyrskiy A.R., *Sayan Mts, Irkutskaya obl., Krasnoyarskiy kray, Yakutia, Buryatia, Chitinskaya obl.), Russian Far East (Magadanskaya obl., Amurskaya obl., Kamchatka, Sakhalin, Kunashir Il.), Mongolia, Japan (Honshu).

MATERIAL EXAMINED. RUSSIA: Moskovskaya obl.: Davydovo, 5.V 1929 (Rysakov), 1f. - Nenetskiy A.R.: Yugorskiy Peninsula, 24.VI 1957 (Chernov), 1f. - Yamalo-Nenetskiy A.R.: 55 km W Samburg, 12.VIII 1966 (K.Gorodkov), 1f. - Irkutskaya obl.: Padun, Verkhnyaya Tunguzka [vic. of Bratsk], 18.VI 1867 (Chekanovskiy), 1m; Nizhnyaya Tunguzka (Chekanovskiy), 2m. - Sayan Mts, 30th Lake, 27.VII 1924 (Kozhanchikov), 1f. - Yakutia: right bank of Indigirka River, facing Tebyulyakh, 28.VI 1973 (Vinokurov), 1m, 2f, 1ex.; Namskoc, left bank of Lena River, about 90 km from Yakutsk, 17.VII

1926 (L.Bianki), 1f; Oy-Bes, by Pavlovskoe, district of Yakutsk, 30.VI 1925 (Ivanov), 1f; Lena River, about 10 km below Surguev, Enkyur-uyrakh, 27.V 1091 (Gerts), 1f; Kidey Lake, path to Amgu River, 15.VII 1925 (L.Bianki), 1m; Khattygy-toerdoc on Amgu River, 6.VIII 1925 (L.Bianki), 1f, 1 ex. - Amurskaya obl.: vic. of Mariinsk, 15.VII 1977 (Z.Konovalova), 1f; Khorogochi, 3.VII 1975 (Bodrova), 1f; 25 km WSW Shimanovsk, 11-12.VIII 1982 (Makarkin), 4f, 1 ex.; 60 km SW Shimanovsk, 12.VIII 1982 (Makarkin), 1f; 35 km E Shimanovsk, 10.VIII 1982 (Makarkin), 1f; 40 km W Svobodny, 15.VIII 1982 (Makarkin), 1f. - Khabarovskiy kray: Bolshoy Shantar Il., 1925, 1m; ibidem, Amuka River, March 1925 (Dulkeit), 1f; district of Okhotsk, Gyrbykan basin, 18.VII-17.VIII 1986 (Sukacheva), 7f; district of Okhotsk, Khetana River, tributary of Amka River, Ul'ya basin, 10.VIII 1986 (V.Zherikhin), 1f; Postyshevo, 28.VI 1982 (Makarkin), 2m, 1 ex.; Bureinskiy Ridge, Suluk-Makit River, 6.VII 1988 (V.Mutin), 1m. - Magadanskaya obl.: Research Station Aborigen, 11.VIII 1986 (V.Dubatolov), 1f; Kolymskoe Upland, Elekhanskies Lakes, 11.VIII 1969 (A.Egorov), 4f; 18 km E Kulu, 14-22.VII 1980 (Marchenko), 2f; ibidem, 24-26.VII 1983 (Makarkin), 4f, 1 ex.; vic. of Sibit-Tyellakh, 8-28.VII 1987 (Y.Tshistyakov), 1m, 1 ex.; vic. of Magadan, Snezhnaya Dolina, 3.VIII 1983 (Makarkin), 1m. - Kamchatka: Kozyrevsk, 12-22.VII 1985 (S.Belokobyl'skiy), 1m, 5f; 10 km S Kozyrevsk, 23.VII 1985 (S.Belokobyl'skiy), 1m; Atlasovo, 10.VII 1985 (S.Belokobyl'skiy), 1f, 2m. - Sakhalin: Yuzhno-Sakhal'sk, 26.VII 1975 (M.Nesterov), 1m; Novoalexandrovsk, 10-11.VII 1986 (M.Nesterov), 3m, 3f, 2 ex.; ibidem, 27.VII 1984, 2f, 5.VI-27.VII 1986, 2m, 2f, 28.VII 1987, 1f (A.Basarukin); Susunayskiy Ridge, 6-12.VII 1986 (M.Nesterov), 4m, 4f; ibidem, 3.IX 1988 (A.Basarukin), 1f; 5 km W Ozerskiy, 13.VIII 1981 (S.Belokobyl'skiy), 2f; cape Pogibi, 15.VI 1979 (Nechaev), 1f; Shmidt Peninsula, 25-31.VI 1988 (Nechaev), 1m, 2f; district of Korsakov, 2-3th nad' [a river valley], 19.VII 1986 (A.Basarukin), 3m, 4f. - Kunashir: volcano Golovnin, 25.VII 1973 (Zhiltsova), 1f; 7 km N Mendeleev, 2.VIII 1981 (S.Belokobyl'skiy), 1f. MONGOLIA: Central aymak: Urga [= Ulan-Bator], Tola River, 16-17.VII 1905 (P.Kozlov), 1f. - Bayan-Hongor aymak: ruins of temple Lamyn-Gegen, south Khangai, 16.VII 1926 (Kirichenko), 1m. (see: Makarkin, 1984).

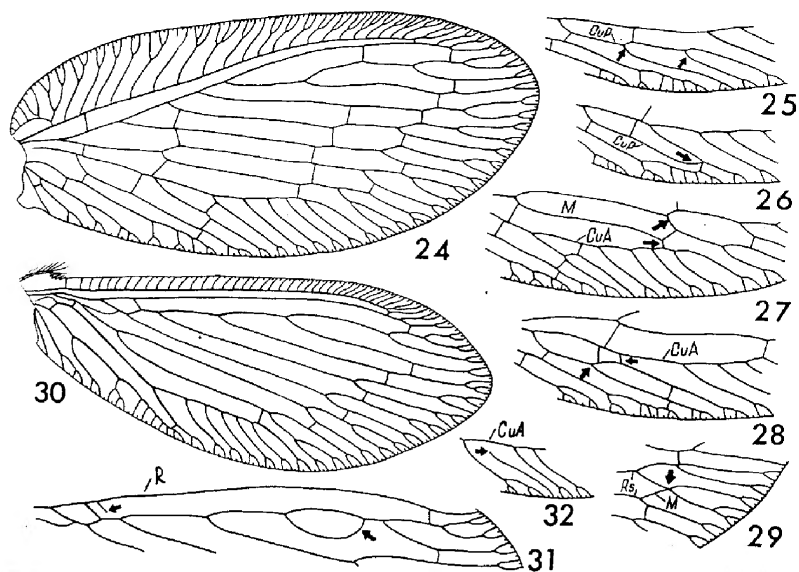
***Wesmaelius (Wesmaelius) asiaticus* Yang, 1980**

Figs. 7-13, 24-32

Wesmaelius asiaticus Yang, 1980: 56, figs 2a, 3. [Holotype: female, China: "Hopei, 22.VIII 1973, 1700 m" in Agricultural University, Beijing].

Wesmaelius asiaticus: Makarkin, 1990: 42, figs. 4-5; 1901: 241; 1993: 13; Makarkin & Kholin, 1995: 422.

COLORATION. Head blackish brown, vertex yellowish brown. Scapus dark brown, pedicellum brown, flagellum brownish. Palpi brownish. Pronotum



Figs. 24-32. Wing venation of *Wesmalius asiaticus*.

mostly yellowish brown, laterally blackish brown. Mesonotum yellowish brown, anteriorly and laterally dark brown. Metanotum medially yellowish brown, laterally brown. Legs pale brownish, spots on the fore and middle tibiae indistinct. Fore wing membrane with indistinct sagittate spots. Longitudinal veins pale with dark interruption. Crossveins dark brown. Crossveins in the gradate series margined with dark brown or pale brown, but not formed in the continuous transverse bands as in *W. quadrifasciatus*. Hind wing membrane basally paler, along external margin dark; veins colored respectively: pale in basal part of wing, dark in external and apical parts.

VENATION. Fore wing (N = 66) (Fig. 24). *Rs* with 3 (N=6), 4 (N=57) or 5 (N=3) branches; the distal one with 1 (N=1), 2 (N=18), 3 (N=42) or 4 (N=5) secondary branches; *Gr1*: *rs1-rs2*, *rs1-m* and *m-cua* always present; *cua-cup* simple (N=62), double (N=2), furcate (N=1), or absent (N=1). *Gr2* with 4 (N=5), 5 (N=40), 6 (N=17), or 7 (N=4) crossveins. *Gr3* with 7 (N=5), 8 (N=34), 9 (N=25), or 10 (N=2) crossveins, of these 3 double and 1 furcate. Between branches of *Cu* and *A1* 1 (N=2), 2 (N=21), 3 (N=29), or 4 (N=4) crossveins, of these 7 double.

Additional crossveins. One crossvein between *Sc*-branches (N=1): *r-rs2* (N=1); *r-rs3* (N=1).

Anomalies. *r-rs* in *Gr3* absent (N=1). *R*s2 forked basally (N=2); *M* fused apically with *CuA* (N=1, Fig. 27); *R*s1 fused for short distance with *M* (N=1, Fig. 29); *CuP* forked (N=2, Fig. 25, 28) or fused apically with *CuA* (N=1, Fig. 26).

Hind wing (N = 33) (Fig. 30). *R*s with 4 (N=8), 5 (N=23), or 6 (N=2) branches. *r* simple (N=29), double (N=2, Fig. 1), furcate (N=1), or located distally to the base of *R*s1 (N=1). *b* ending proximally to the arising of *R*s1 (N=30), interstitially (N=1) or distally to this point (N=2). *Gr2* with 1 (N=29), 2 (N=3) or without (N=1) crossveins. *Gr3* with 5 (N=4), 6 (N=2), 7 (N=13), or 8 (N=14) crossveins, of these 4 double. No crossveins between *Cu*-branches.

Additional crossvein. *r-rs* (N=1).

Anomalies. *R*s4 looped (N=1, Fig. 31). *CuA2* reduced basally (N=1, Fig. 32).

MALE. Apex of abdomen as in Fig. 9, gonarcus as in Figs. 10-11, parabuculum as in Figs. 7-8.

FEMALE. Apex of abdomen as in Fig. 12, subgenitale as in Fig. 13.

FORE WING LENGTH. Male: 8.0-11.1 mm (9.5 mm), N = 15; female: 9.6-11.3 mm (10.2 mm), N = 15.

DISTRIBUTION. Russian Far East (Primorskiy kray, Khabarovskiy kray), North-East China (Hebei).

MATERIAL EXAMINED. Primorskiy kray: vic. of Anisimovka, Smolnyi Stream, 17-19.VI 1982, 2m, 11; Mt. Litovka [= Khualaza], 31.VII 1982, 1m; Bolshaya Ussurka River, Dersu, 14.VI 1990, 1m. - Khabarovskiy kray: vic. of Khabarovsk, Bychikha, 21-22.VI 1982, 2m, 10f; Myaochan Ridge, 10 km S Gornyi, 24-25.VI 1982, 2m; vic. of Komsomolsk-on-Amur, Pivan', 26.VI 1982, 9m, 5f. All specimens collected by the author.

REMARKS. The male has basal segments of antennae strongly enlarged and provided with long and stout yellowish red setae. The female may be distinguished from other species of the genus by the shape of subgenitalia, which has a rounded apex.

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Editorial Board: A.S.Lelej Yu.A.Tshistjakov

N.V.Kurzenko V.N.Makarkin

Address: Institute of Biology and Pedology, Far East Branch of Russian Academy of Sciences, 690022, Vladivostok-22, Russia.

FAX: (4232) 310 193

E-mail: entomol@stv.iasnet.com